

# PHIN Alerting: Directory Exchange and Directory Privacy

Proposal of the  
Alerts and Communications Users Group

2<sup>nd</sup> PHIN Conference

May 25<sup>th</sup> 2004

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Larry Hanrahan



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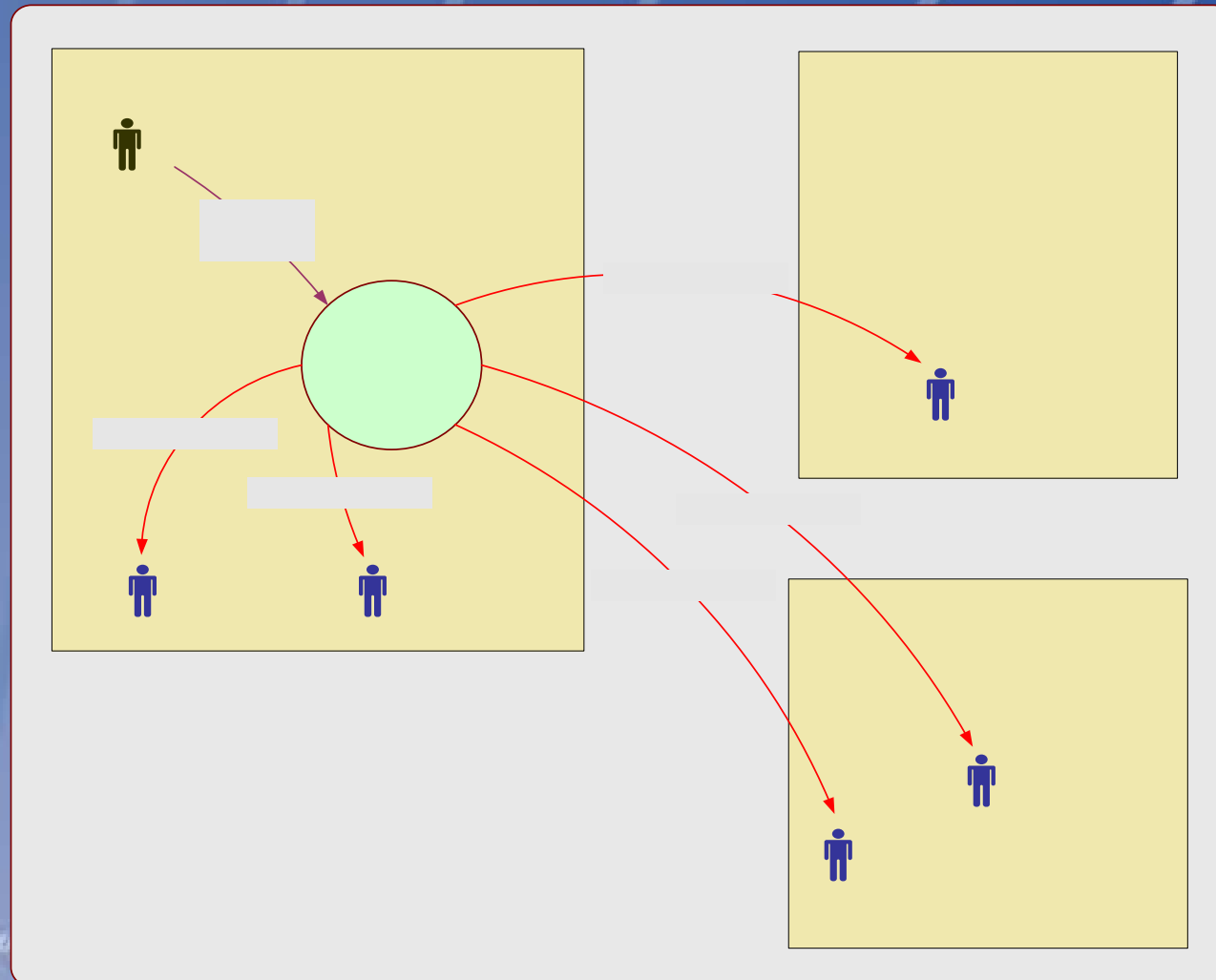
# Agenda

- Overview
  - ◆ PHIN Alerting
  - ◆ Directory Exchange
- Alerts and Communications User Group
- Proposed Directory Exchange Protocol
- Proposed Directory Privacy and Security Protocol



# PHIN Alerting

## Direct Alerting

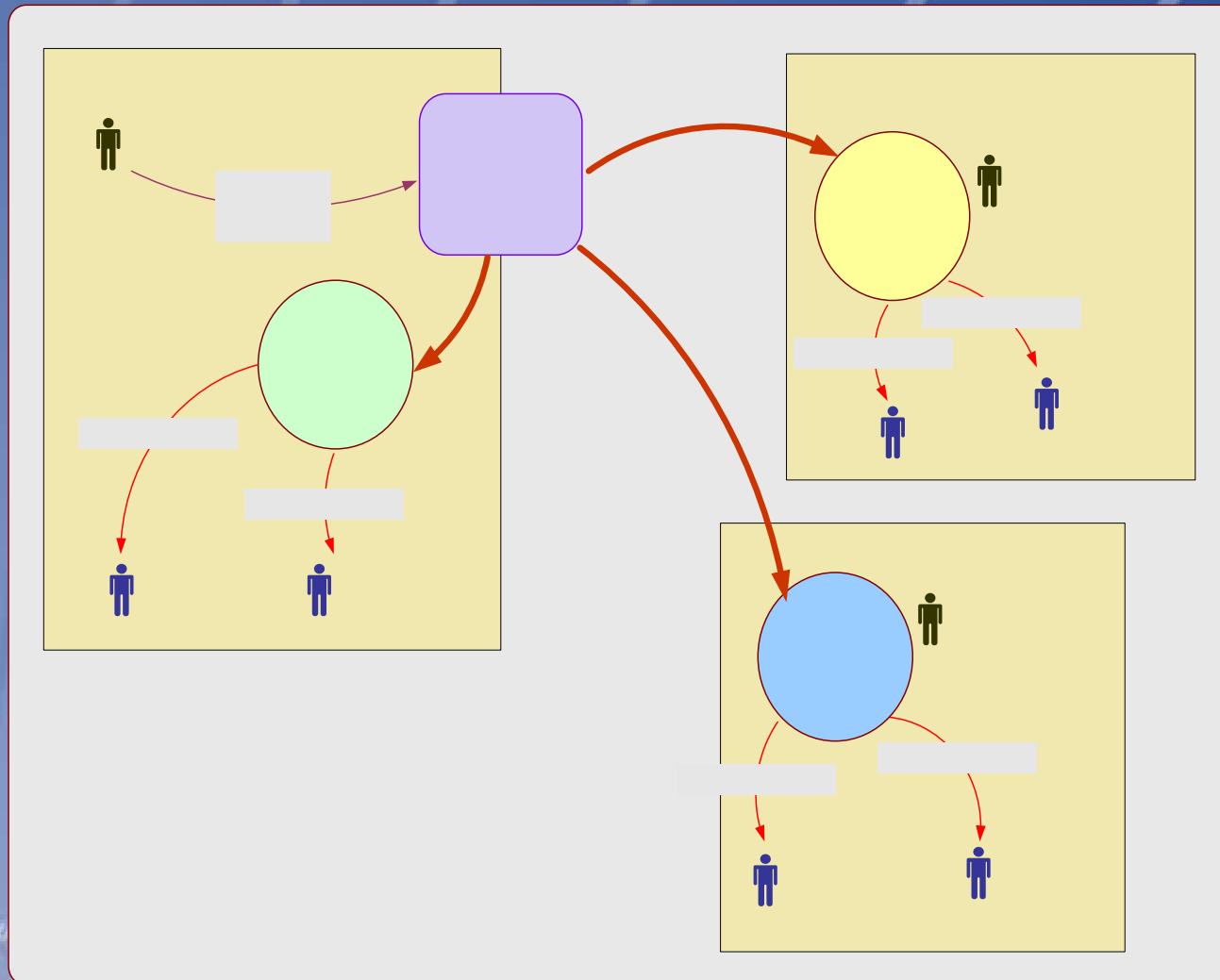


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# PHIN Alerting

## Cascade Alerting



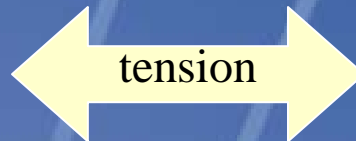
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Administra

# Directory exchange

## Need:

- Emergency communication and response
- Routine communication and program operation
- Collaboration



## Issues/problems:

- Assuring appropriate use of information
- Organizational ownership of directory data
- Privacy of personal information



# Directory exchange

## Need:

- Emergency communication and response
- Routine communication and program operation
- Collaboration

## Issues/problems:

- Assuring appropriate use of information
- Organizational ownership of directory data
- Privacy of personal information

**Resolve with negotiated agreements and protocols**



# StatePublicHealth.org

## Public Directory Arizona

### Arizona: Arizona Department of Health Services

Located: 1740 West Adams, Room 407  
Phoenix, AZ 85007

phone: (602) 542-1025

web: [www.hs.state.az.us](http://www.hs.state.az.us)

fax: (602) 542-1062

## State Public Health Agencies in Arizona

Name	Title	Phone/Fax	Email
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<b>Catherine R. England PhD</b> State Health Official	Director	(602) 542-1025/(605) 542-1062	<a href="mailto:ecccc@hs.state.az.us">ecccc@hs.state.az.us</a>
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# Directory exchange objectives

- Distribute maintenance of directory
- Automate and routinize exchange of directory information
- Reduce/eliminate redundant directory maintenance
- Improve directory currency
- Integrate electronic directory into applications & systems (like Alerting Systems)

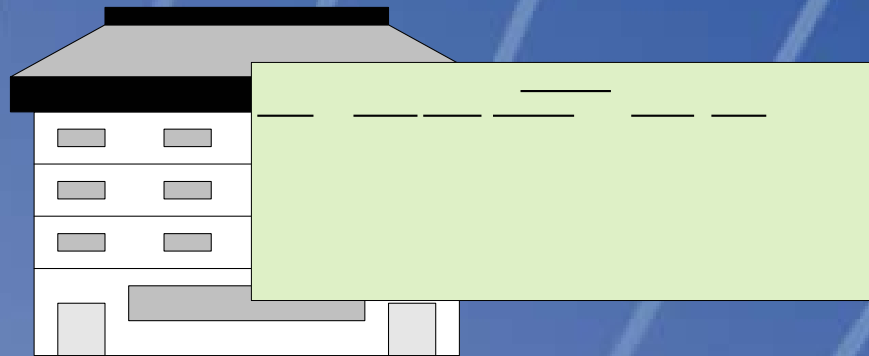




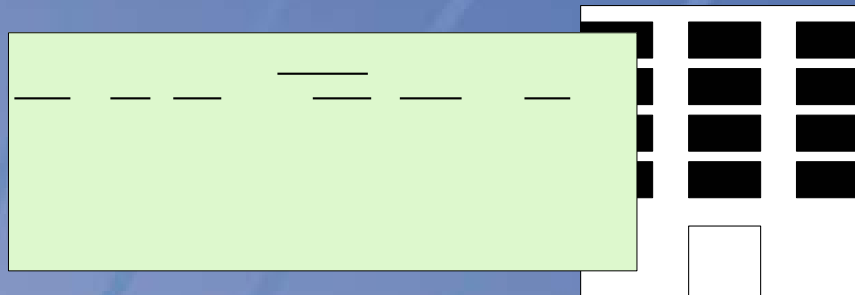
# Directory exchange “big picture”

Partners maintain their own directories

Partner 1



Partner 2

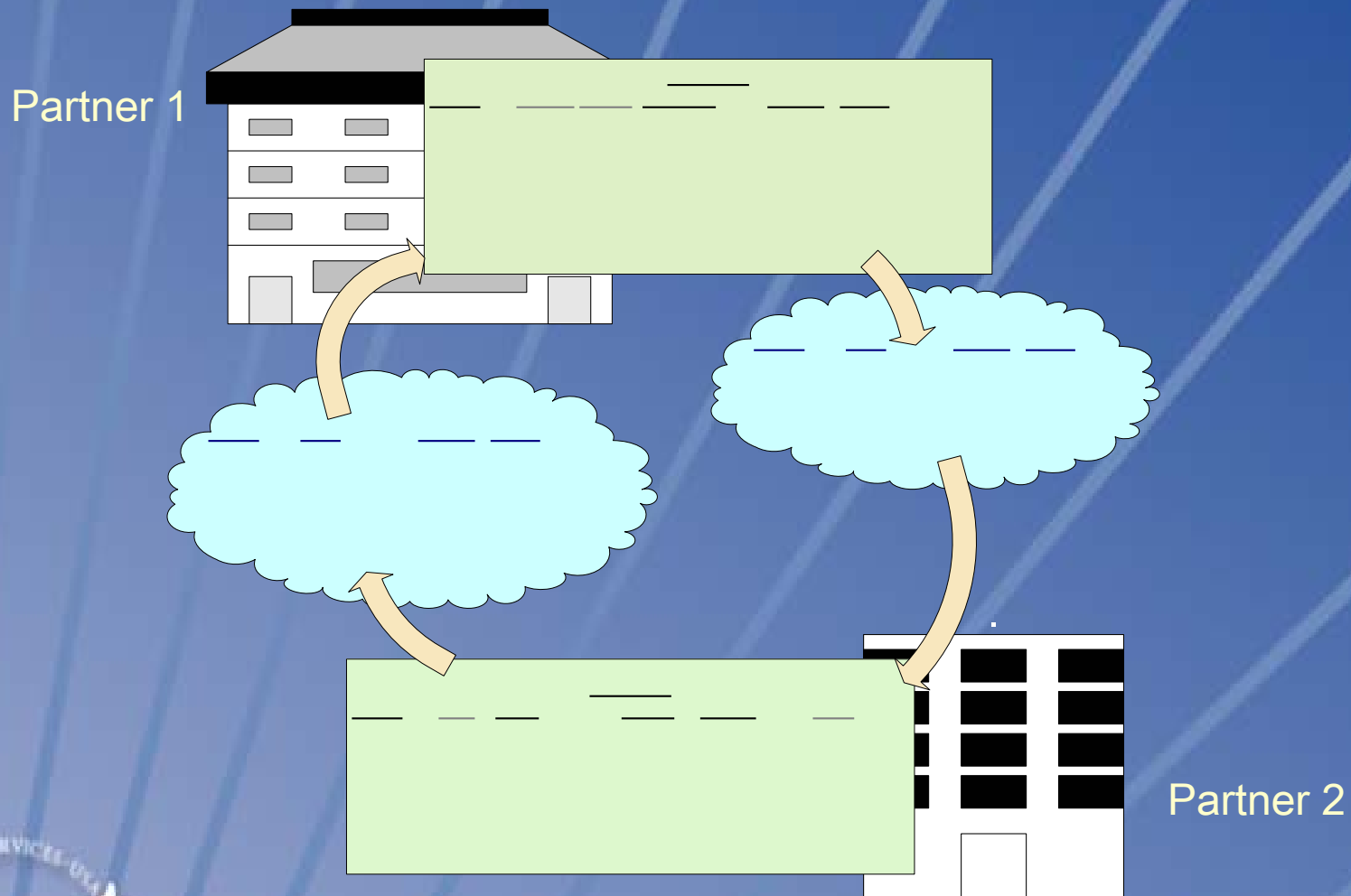


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# Directory exchange “big picture”

Exchange *some* attributes of *some* people

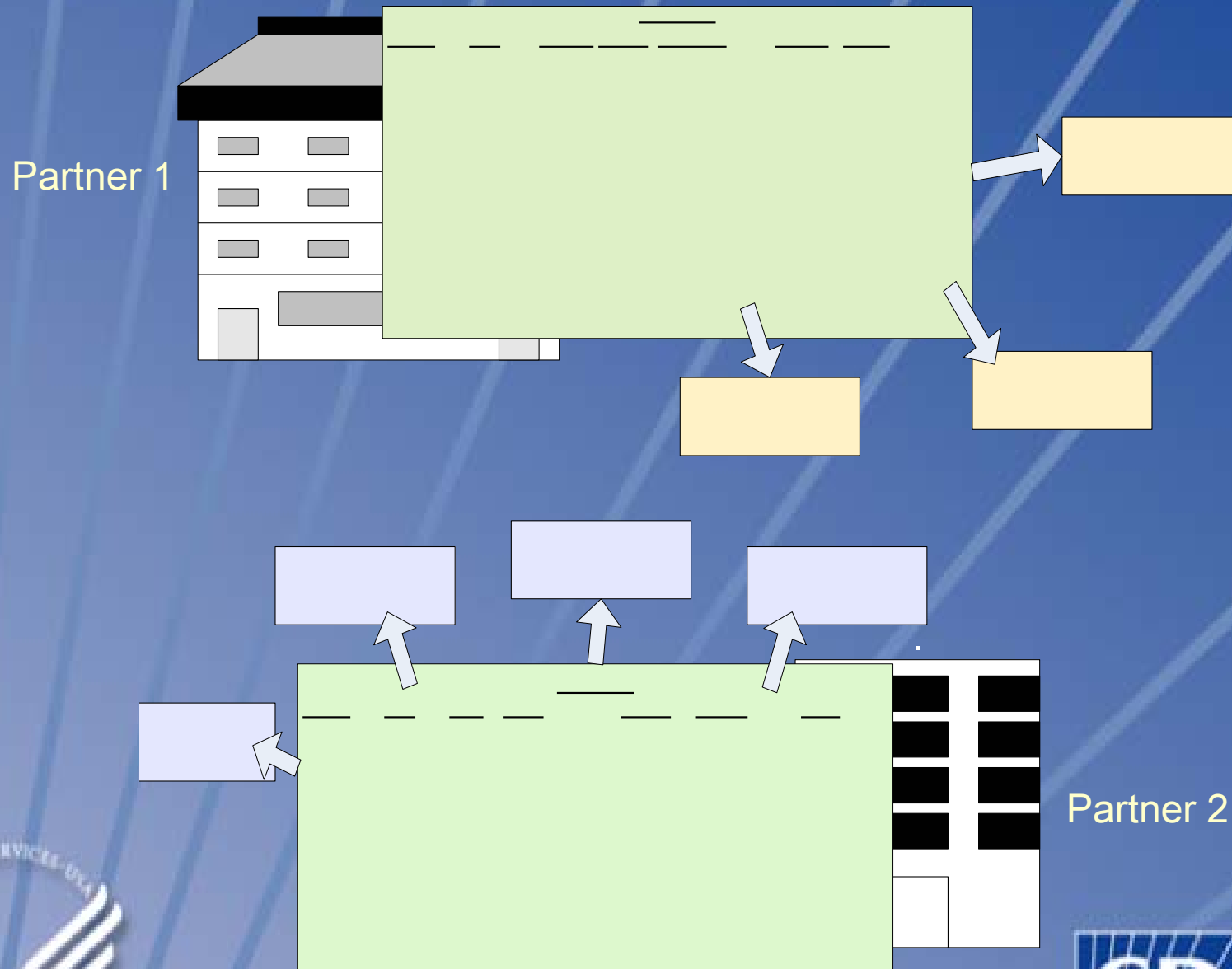


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# Directory exchange “big picture”

Use combined directories in systems



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# Work Group

**Partner meeting on alerting requirements, 3/9/04**

State HDs, Local HDs ASTHO, NACCHO, CDC



**Alerts & Communications Users Group (ACUG), 3/16/04**

Task: develop PHIN alert protocols



**Alert and Communication  
Protocols Workgroup**

Task: business protocols



**PHIN Alerting Network  
Architecture & Modeling  
workgroup, 3/24/04**

Task: technical specifications:

- **directory exchange**
- **directory privacy**
- cascade alerting
- role vocabulary



**Redundant  
Communications  
Workgroup**

Task: failover  
technologies



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# Alerts and Communications User Group

## PHIN Alerting Network Architecture & Modeling workgroup

■ John Abellera	CSTE
■ Tim Boorman	Washington
■ Robb Chapman	CDC
■ Bill Colville	Michigan
■ Kevin Cueto	Nebraska
■ Richard Draut	CDC (Contractor)
■ Janet Fath	CDC (Epi-X)
■ Nedra Garrett	CDC
■ Bob Hall	California
■ Larry Hanrahan	Wisconsin
■ Tony Pruitt	CDC (Contractor)
■ Terry Puls	CDC (Epi-X)
■ Gilberto Ramirez	CDC (HAN)
■ Tom Russell	CDC (Contractor)
■ Gregory Smith	Public Health Foundation Enterprises
■ Debra Sottolano	New York State
■ Art Thacher	Maryland
■ Anthony Zenk	Alaska



# Work group directives

- Focus on technical specifications
- Defer “business rules” and policies to other groups
- Use applicable industry standards



# Alerts and Communications User Group

**Our proposals for  
Directory Exchange  
protocol:**



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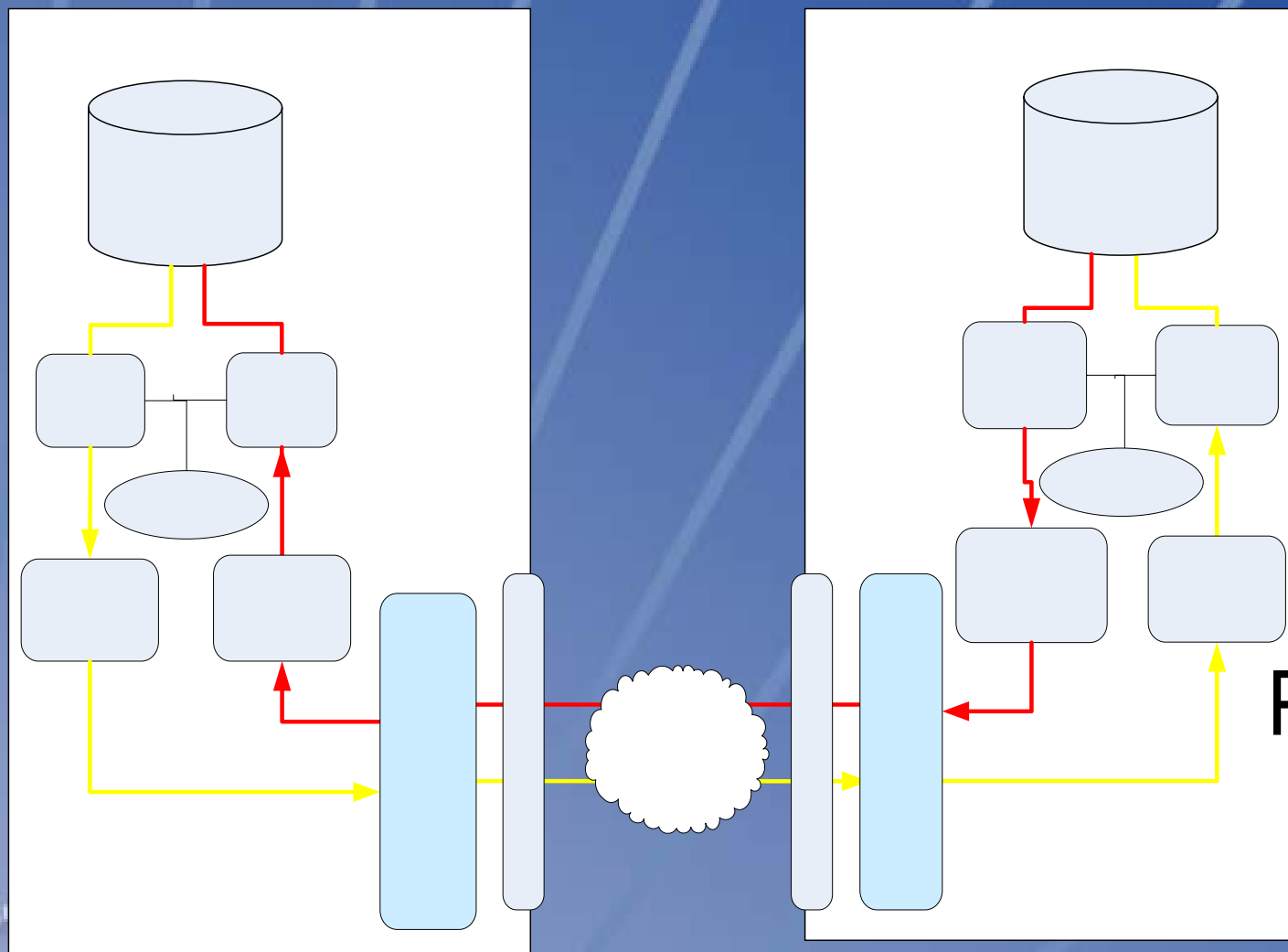
# Technologies for directory exchange

phinDir schema	Specification of attributes and attribute values to exchange
LDAP	Protocol for describing directory schema
DSML	Protocol for directory exchange Structured XML document
PHIN MS	Transport protocol Based on ebXML





# Directory Exchange Process



Partner 1

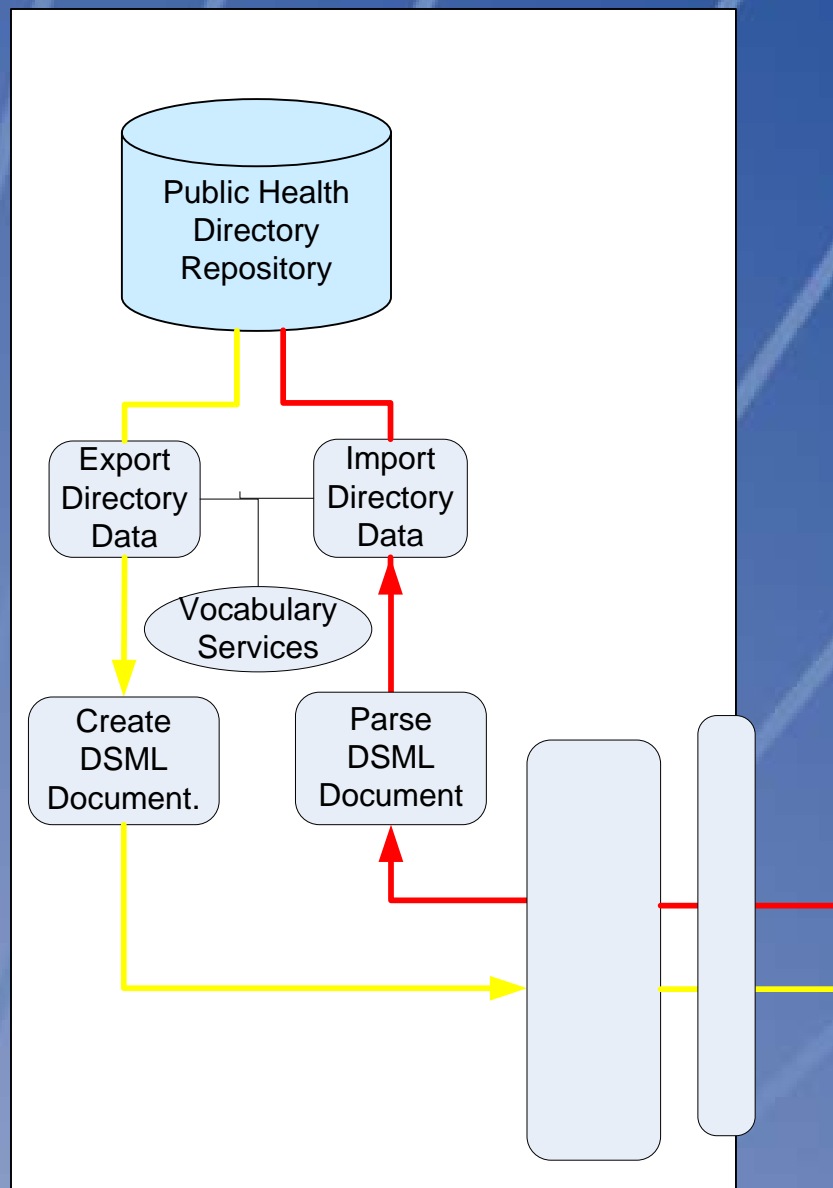
Public Health



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History

# Directory Exchange Process Repository



# LDAP

## Lightweight Directory Access Protocol

- A set of protocols for *accessing* directories
- Designed to separate directory implementation from client systems
- Supported by many COTS products
- *In practice*, also a type of directory repository
  
- PHIN partners are **not required** to implement an LDAP directory
  - ◆ ...but are required to be able to participate in DSML-based directory exchange *as if they had* an LDAP directory
  - ◆ ...are encouraged to implement an LDAP directory if possible



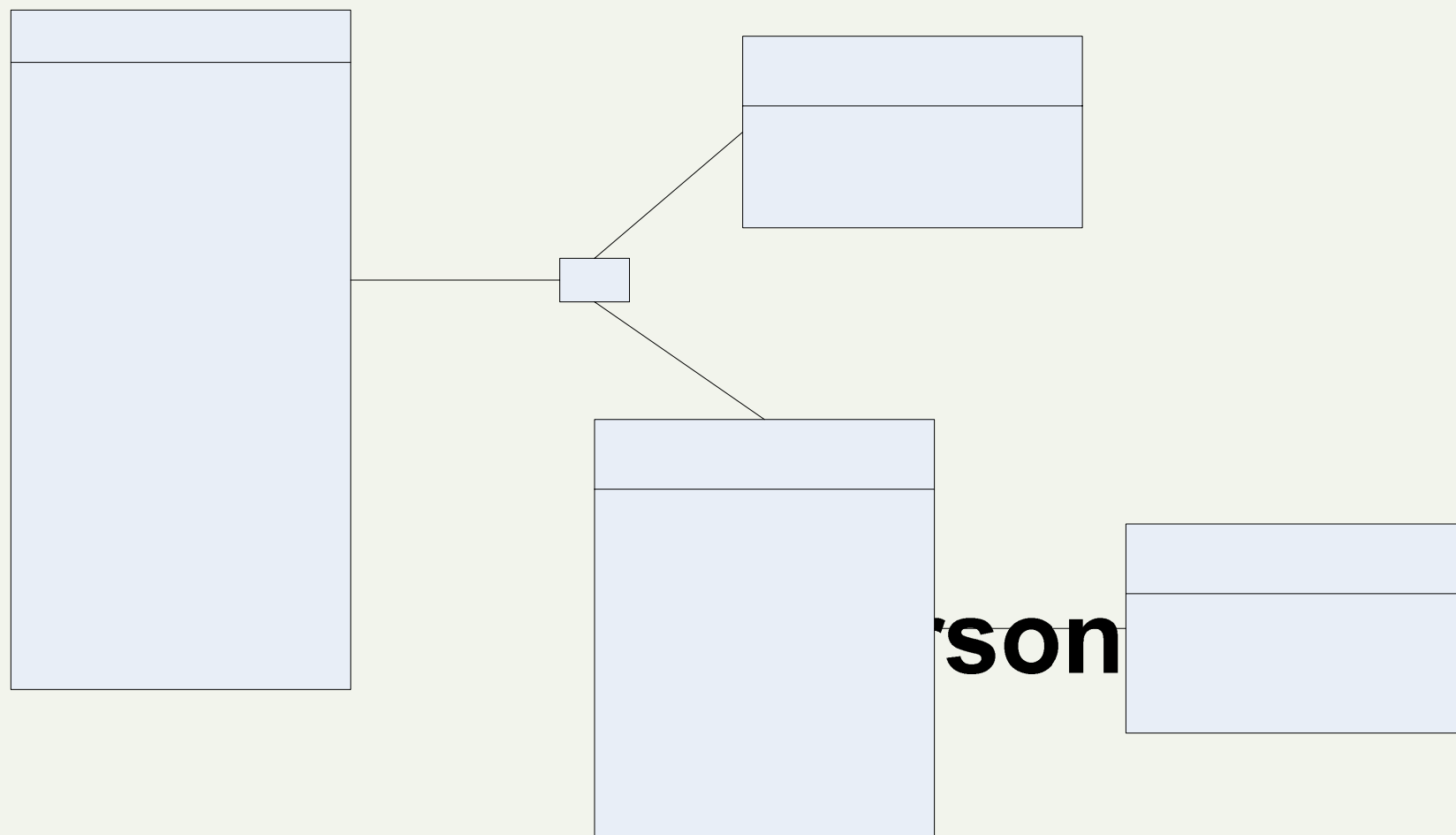
# phinDir schema

LDAP schema for the Public Health Directory (phinDir)

- Classes:
  - ◆ People
  - ◆ Public Health Roles
  - ◆ Organizations
  - ◆ Organization Types
- Uses subclasses of standard LDAPv3 classes wherever possible
- Implementation schema for the Directory at CDC
- Reference model for LDAP directories in public health
- PHIN partners are **not required** to implement the schema in their directories
  - ◆ ...but are encouraged to implement the schema if possible
  - ◆ ...are required to be able to map their directory attributes to required schema attributes



# phinDir Schema



Name

Job Title

Degree(s)



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# phinDir schema

Attribute	Description
<u>Cn (commonName)</u>	The person's common name, usually a first name followed by a surname.
<u>sn (surname)</u>	The person's <u>surname</u> , or last name.
<u>phinDirUID</u>	The person's Unique Identifier within the public health directory (UID).

**Table 1: Optional LDAP Attributes for phinDirPerson**

Attribute	Description
<u>displayName</u>	Preferred name of a person to be displayed when displaying directory entries. Most often a concatenation of given name and surname.
<u>fax (facsimileTelephoneNumber)</u>	The person's fax number.
<u>givenName</u>	The person's given, or first, name.
<u>l (localityName)</u>	City or town in which the person resides.
<u>mail</u>	The person's email address.
<u>mobile</u>	The person's mobile phone number.
<u>pager</u>	The person's pager number.
<u>preferredLanguage</u>	A person's preferred written or spoken language.
<u>st (stateOrProvinceName)</u>	State or province in which the person is located.
<u>telephoneNumber</u>	The person's work telephone number.
<u>title</u>	The person's job title.



# We Need Unique Identifiers for Person, Organization, etc

## ISO Object Identifier (OID)

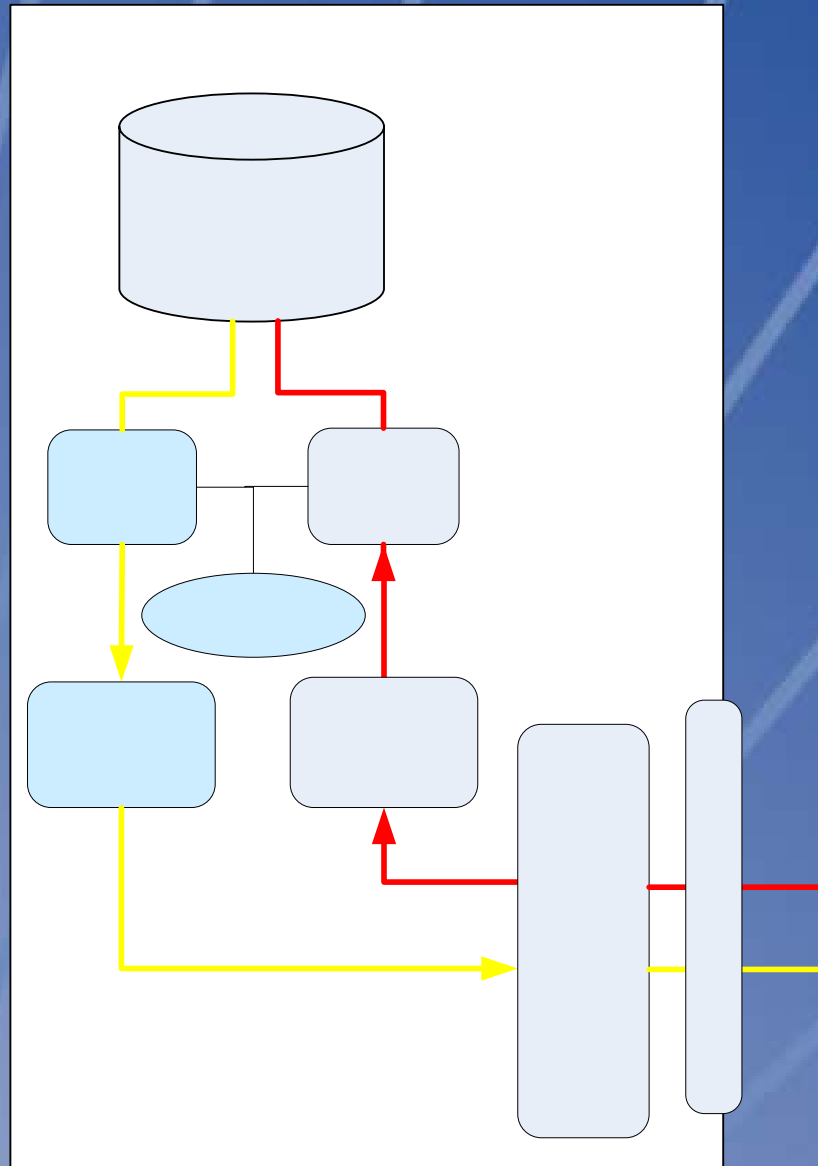
- ISO/IETF standard
- Used in other areas of PHIN

### Examples:

2.16.840.1.17244	Centerville Department of Health
2.16.840.1.17244.5	Centerville DOH Applications
2.16.840.1.17244.5.1	Centerville's NEDSS instance
2.16.840.1.17244.11	Centerville DOH Staff
2.16.840.1.17244.11.1	Mary Smith, MD, MPH
2.16.840.1.17244.11.2	John Brown, MPH



# Directory Exchange Process Transformation



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# DSML

## Directory Service Markup Language

- Combines directory services technology (LDAP) with XML syntax
- Easy way to share directory data
  - ◆ across organizations
  - ◆ across different directory implementations and platforms
- Provides an XML DTD and a schema for reference  
(DSML namespace:  
<http://www.dsml.org/DSML>)



# DSML

```
<dsml:directory-entries>
  <dsml:directory-entry dn="phindirUID=100213.12321.4006.1230.10023,
st=GA, c=US, ou=people">
    <dsml:objectclass>
      <dsml:oc-value>top</dsml:oc-value>
      <dsml:oc-value>person</dsml:oc-value>
      <dsml:oc-value>inetOrgPerson</dsml:oc-value>
    </dsml:objectclass>
    <dsml:attr name="sn">
      <dsml:value>Chapman</dsml:value>
    </dsml:attr>
    <dsml:attr name="givenname">
      <dsml:value>Robb</dsml:value>
    </dsml:attr>
    <dsml:attr name="cn">
      <dsml:value>Robb Chapman</dsml:value>
    </dsml:attr>
    <dsml:attr name="mail">
      <dsml:value>rsc0@cdc.gov</dsml:value>
    </dsml:attr>
    <dsml:attr name="telephoneNumber">
      <dsml:value>(404) 639-7369</dsml:value>
    </dsml:attr>
  </dsml:entry>
</dsml:directory-entries>
```

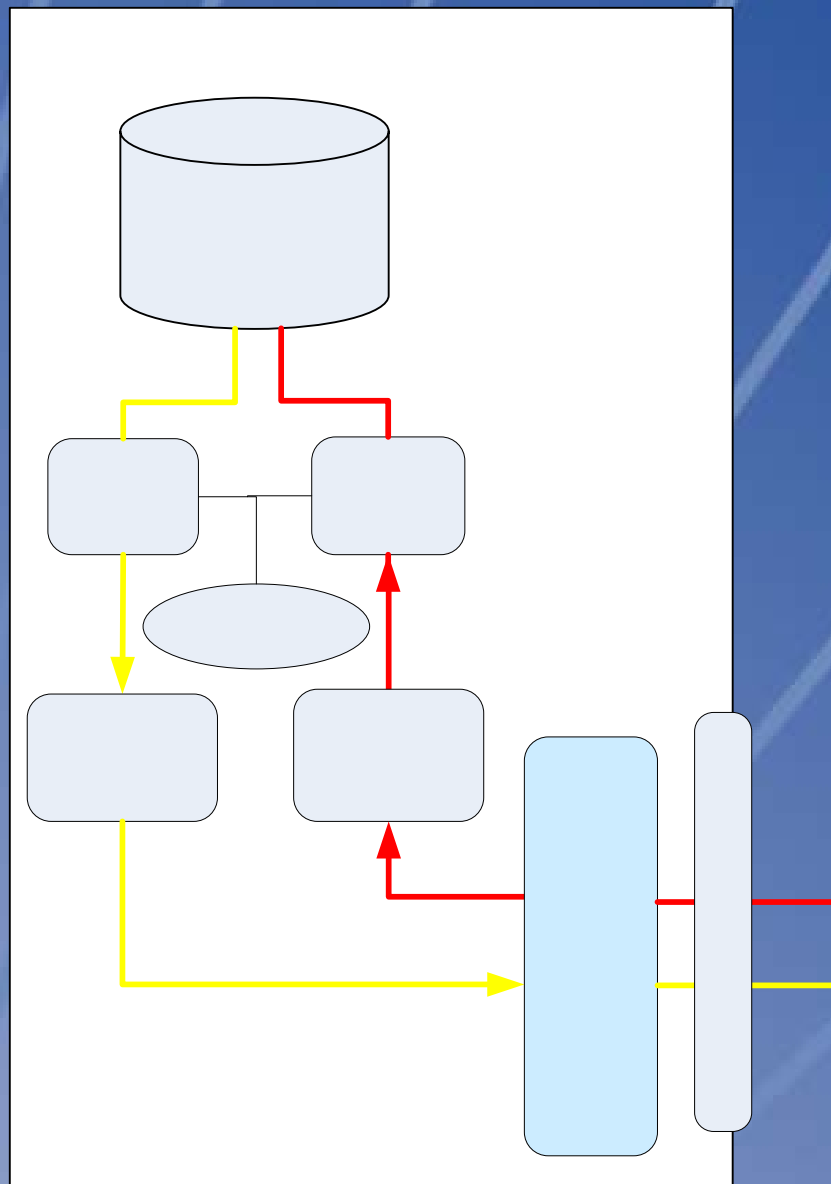


# DSML

- We won't use everything provided by DSML:
  - ◆ Transport protocol
  - ◆ Certificate-based authentication...because we aren't requiring all partners to implement the phinDir schema in an actual LDAP directory
- PHIN partners who implement the phinDir schema in an LDAP directory will be able to implement DSML ~~very easily~~ **more**
- PHIN partners **are required** to send and receive DSML messages **as if** they had implemented the phinDir schema



# Directory Exchange Process Transmission



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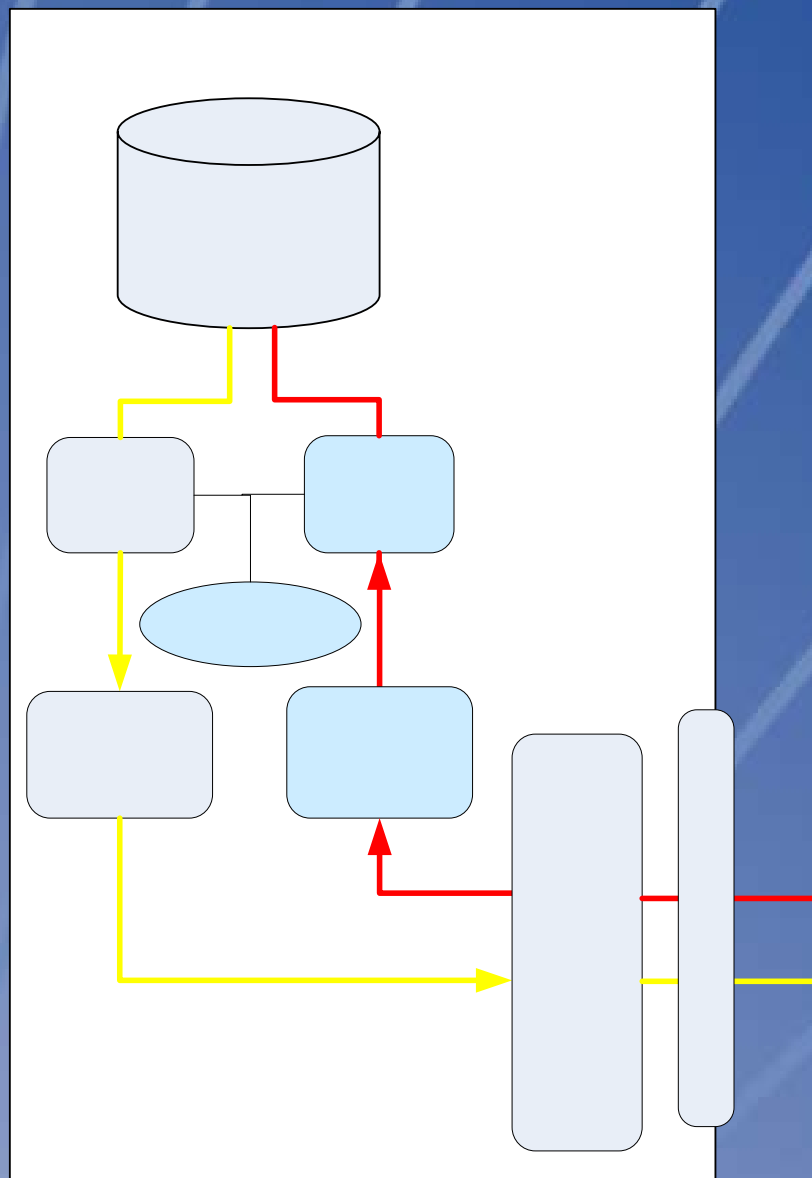
# PHIN MS

## PHIN Messaging System

- PHIN adaptation of ebXML
  - Platform and payload independent
  - Secure (PKI based)
  - Guaranteed delivery
  - Non-repudiation
  - Firewall friendly
  - “Free” & supported
- 
- PHIN partners will be implementing anyway, for use in NEDSS, lab messaging, ...
  - PHIN partners **are required** to send and receive directory exchange messages using the PHIN MS transport



# Directory Exchange Process Transformation



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# Technologies for directory exchange

phinDir schema <i>Must map to</i>	Specification of attributes and attribute values to exchange
LDAP	Protocol for describing directory schema
DSML <i>Must use</i>	Protocol for directory exchange Structured XML document
PHIN MS <i>Must use</i>	Transport protocol Based on ebXML



# Alerts and Communications User Group

**Our proposals for  
Directory Privacy and  
Security:**



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# Directory Privacy and Security

## Issue

- Emergency alerting requires potentially sensitive directory information
  - ◆ Home telephone number
  - ◆ Cell phone number
- Some of this information must be shared across organizations
- Partners require assurance of appropriate information use



# Directory Privacy and Security

## Goal

- Establish inter-organizational data privacy and data security policy for Public Health Directory
- Incorporate into PHIN standards for directory exchange
- Incorporate into data exchange agreements
- Enable PHIN partners to give assurances to their personnel as to who will have access to directory information and how it will be used



# Scope

## **This directory data privacy and security policy**

- Exists solely to support PHIN Alerting and Communications (so far)
- Governs only the sharing of directory data across organizations
- Does not govern any organization's policies regarding internal directory information on their own staff
- Is not complete
  - ◆ additional controls may become necessary in future to support other uses of the Public Health Directory



# Policy

- Directory content is visible only to people registered in the directory
- Partners will prevent users of their directory from seeing private information of people in other organizations
- No partner organization will release directory information shared by another partner to a third party without specific consent of the owning partner



# Categories of directory attributes

- **Public person attributes**

- ◆ are exchanged across organizations
- ◆ are replicated in other organizations' directories
- ◆ may be viewed by human users in those other organizations

- **Private person attributes**

- ◆ are exchanged across organizations
- ◆ are replicated in other organizations' directories
- ◆ may *not* be viewed by human users in those other organizations

- **Unshared person attributes**

- ◆ are unnecessary to support alerting
- ◆ therefore are not exchanged across organizations



# Categories of directory attributes

- **Organization attributes**
  - ◆ can be exchanged across organizations
  - ◆ none are private
- **Role attributes**
  - ◆ can be exchanged across organizations
  - ◆ none are private



# *Public Person Attributes*

May be read and utilized by people in  
other organizations



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# *Private* Person Attributes

Will be treated as *sensitive but unclassified* (SBU) information

May be read and utilized by an alerting system in another organization



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# *Private* Person Attributes

May *not* be viewed or used by any person in another organization

*...Except:*

- Operators of alerting system that equate ability to send an alert with ability to view all recipient information
- Administrators of directories and alerting systems, where necessary as part of systems operations/maintenance
- When an alerting system has problems and manual override is necessary



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# Public Person Attributes

Attribute	Description
Cn (commonName)	Person's common name (first name followed by a surname)
phindirUID	The person's Unique Identifier within the public health directory (UID).
sn (surname)	Person's surname, or last name.
givenName	The person's given, or first, name.
displayName	Preferred name of a person to be displayed
st (stateOrProvinceName)	State or province in which the person is located.
l (localityName)	City or town in which the person resides.
phindirCounty	The county in which a person is located.
title	The person's job title.
preferredLanguage	A person's preferred written or spoken language.

# *Public Person Attributes*

Attribute	Description
phindirHighestDegree	Highest academic degree achieved.
phindirOtherDegree	Other academic degrees achieved.
phindirProfessionalLicense	Identifiers of professional licenses held per jurisdiction.
phindirPrimaryExpertise	DN of the person's primary area of expertise.
phindirSecondaryExpertise	DNs of other areas of expertise.
phindirPrimaryOrganization Role	DN of the person's primary organizational role affiliation with regard to public health.
phindirAssociatedOrgRole	DNs of organization / roles that a person is associated with.
phindirPublicHealthCommission.	Person's public health commission.



# *Public Person Attributes*

Attribute	Description
preferredDeliveryMethod	preferredDeliveryMethod The person's preferred method of contact or delivery. This attribute should contain values such as "email" or "work phone".
telephoneNumber	The person's work telephone number.
mail	The person's email address.
fax (facsimileTelephoneNumber)	The person's fax number.



# *Private* Person Attributes

Attribute	Description
phindirDirectPhone	Phone number of the direct line to a person's office
pager	The person's pager number
phindirAlphaPager	Number of the person's alphanumeric pager
mobile	The person's mobile phone number
phindirSatellitePhone	The person's satellite phone number
phindirHomeMail	The person's home email address
homeTelephoneNumber	The person's home telephone number



# Directory information about *affiliates*

(private clinicians, hospital and private lab staff, law enforcement, first responders...)

- Treat just like directory data received from another PHIN partner
- All affiliates can be assured of uniform treatment of their directory information across the entire PHIN



# Directory security

Each partner will implement security controls and procedures to assure adherence to these rules:

- Data access controls to *limit read access* to private person attributes from within applications
- Data repository access controls to limit direct LDAP or database access
- Encryption of directory data containing private person attributes during transmission



# Directory Privacy and Security

## Intent of this policy

is to establish a uniform and comprehensive understanding of the rules governing access to and use of potentially sensitive personal information in the directory.

By agreeing to observe this policy, PHIN partners establish a basis for mutual assurance and trust regarding the management and use of such information across organizational boundaries. In turn, partner organizations will be able to provide corresponding assurance to their personnel and affiliates.





# Contact information

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Alerts and Communications Users Group

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# Roundtable Discussion



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# Roundtable Discussion Topics

- Adoption of
  - ◆ phinDir schema for directory exchange
  - ◆ DSML for directory exchange
  - ◆ PHIN MS for directory exchange
- Set of attributes to exchange
- Designation of public & private attributes
- Treatment of private attributes

